

REMARKS

Claims 37-52 are pending. Claims 37, 42, 44, 46 and 51 are amended. Claims 1-36 are canceled.

Information Disclosure Statement

A new information disclosure statement is submitted herewith containing the reference cited in the information disclosure statement filed February 16, 2006. Consideration of the information disclosure statement is respectfully requested.

Claim Amendments

Claims 37, 42, 46 and 51 are amended to limit the first glass component to including a vaporous or gaseous substance only. These amendments are supported by the original disclosure and claim 46, for example.

Claims 37, 42, 44, 46 and 51 are amended to specify that the vicinity of the flame at which the second glass component is introduced and atomized is downstream of the nozzle. These amendments are supported, for example, by the original specification at page 3, lines 4-9 and at page 4, lines 30-33, and by Figs. 1-2.

Claims 44 and 51 are amended in to clarify the recitation of the nozzle employed in the claimed method. In particular, the claims now recite "a nozzle" and state that the various recited tubes end at "*said* nozzle." The amendments are supported by FIG. 1 and the description thereof in the specification.

Additionally, claim 44 has been amended at previous line 5 to recite "a nozzle" as opposed to "nozzle." Claim 44 has been further amended to recite "a gas tube *of* said plurality of tubes" and a "liquid tube *of* said plurality of tubes" in order to clarify that the gas tube and liquid tube are included in the recited plurality of tubes rather than in addition to the plurality of tubes.

No new matter has been added.

Claim Rejections - 35 U.S.C. §112

Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 44, 45 and 51-54 as being indefinite under 35 U.S.C. §112, second paragraph.

The Examiner stated that the recitation in claim 44 of the nozzle being “common” to the plurality of tubes and the recitation in claim 51 of the three tubes ending at a “common” nozzle are indefinite. Applicant has removed the term “common” from the claims. Claims 44 and 51 now recite “a nozzle” and state that the plurality of tubes/three tubes end at “said nozzle.” Thus, it is now clear that the multiple tubes end at a single nozzle which is shared by all of the tubes.

The Examiner rejected the recitation of “nozzle” in line 5 of claim 44 for being unclear. This term has been amended to read “a nozzle.”

The Examiner further stated that it is unclear whether the gas tube and liquid tube recited in lines 9 and 12, respectively, of claim 44 are in addition to the plurality of tubes recited earlier in the claim. Claim 44 has been amended to recite “a gas tube *of* said plurality of tubes” and a “liquid tube *of* said plurality of tubes” in order to clarify that the gas tube and liquid tube are included in the recited “plurality of tubes” rather than in addition to the plurality of tubes.

In view of the above amendments, Applicant submits that claims 44, 45 and 51-54 satisfy the requirements of 35 U.S.C. §112, second paragraph.

Claim Rejections - 35 U.S.C. §103

Rejection of Claims 37, 38 and 41 Based on Hawtof and Takahashi

Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 37, 38 and 41 under 35 U.S.C. §103(a) as being unpatentable over Hawtof (US 6,565,823) in view of Takahashi (US 4,388,098).

Applicant notes that, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations.¹ Further, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure.²

An essential evidentiary component of an obviousness rejection is a teaching or suggestion or motivation to combine the prior art references.³ Combining prior art references without evidence of a suggestion, teaching or motivation simply takes the inventors' disclosure as a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight.⁴

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.”⁵ Further with regard to the level of skill of practitioners in the art, there is nothing in the statutes or the case law which makes “that which is within the capabilities of one skilled in the art” synonymous with obviousness.⁶

¹ See MPEP §2143.

² *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) and *See* MPEP §2143.

³ *C.R. Bard, Inc. v. M3 Systems, Inc.*, 48 USPQ2d 1225 (Fed. Cir. 1998)

⁴ *Interconnect Planning Corp. v. Feil*, 227 USPQ 543 (Fed. Cir. 1985)

⁵ *See* MPEP §2143.01, citing *In re Rouffet*, 149 F.3d, 1350, 1357, 47 USPQ2d 1453, 1457-8 (Fed. Cir. 1998).

⁶ *Ex parte Gerlach and Woerner*, 212 USPQ 471 (PTO Bd. App. 1980).

The level of skill in the art cannot be relied upon to provide the suggestion to combine references.⁷

The rejection of claims 37, 38 and 41 based on the combined teachings of Hawtof and Takahashi fails to satisfy the legal requirements for establishing obviousness. First, the references as combined by the Examiner do not teach all of the features recited in the claims. Claim 37 recites introducing a first glass component that consists of a vaporous or gaseous substance. The Examiner maintains that Hawtof teaches a small portion of vapor as a first glass component and a liquid as a second glass component. Applicant submits that Hawtof does not teach or suggest a first glass component that consists of vaporous or gaseous component as recited in claim 37. Hawtof states:

“We generally refer in the discussion to the reactant as being in ‘liquid’ form. What we mean by that is that the reactant is in a substantially liquid state. Some small portion of the reactant may be in vapour form, particularly where preheater 14 is employed, or where a nitrogen blanket over the liquid is employed. A small portion of the reactant can be in vapour form as delivered to the combustion site without adversely affecting the operation of the invention.” *Hawtof*, col. 7, lines 36-44.

It is not reasonable to characterize the small, undesired vaporous portion of the substantially liquid reactant as the claimed first glass component. A fair interpretation is that the Hawtof disclosure teaches a liquid component, as the reactant is delivered as one component, not two separate components. Takahashi also does not teach a first glass component which contains only a gaseous or vaporous substance. Therefore, the combination of Hawtof and Takahashi does not teach or suggest the feature of claim 37 including supplying a first glass component that consists of a vaporous or gaseous substance.

Claim 37 further recites introducing a second glass component that is a liquid solution containing a rare earth metal and atomizing the second glass component with the

⁷ See MPEP §2143.01, citing *Al-Site Corp. v. VSI Int'l Inc.*, 50 USPQ2d 1161 (Fed. Cir. 1999).

atomizing gas in the vicinity of the flame downstream of the nozzle. The Examiner has stated that the second glass component in Hawtof is a rare earth metal, but that there is no teaching that it is a solution. The Examiner has asserted that Takahashi discloses nebulized solutions of metal salts as shown in Fig. 2 and the description related thereto in Hawtof. The Examiner has further stated that applicant has not demonstrated that the term “vicinity” would exclude Takahashi’s location. Claim 37 has been amended to specify that the “vicinity” at which the second glass component is atomized is downstream of the nozzle. Takahashi does not teach or suggest this feature. Therefore, the combination of Hawtof and Takahashi does not teach or suggest the features of claim 37 including introducing a second glass component that is a liquid solution containing a rare earth metal and atomizing the second glass component with the atomizing gas in the vicinity of the flame downstream of the nozzle.

Furthermore, one of ordinary skill in the art would not be motivated to combine the references as has been done by the Examiner. The above-discussed portion of the Hawtof specification (col. 7, lines 36-44) clearly indicates that it is more desirable to have a liquid reactant free of a vaporous portion. Therefore, one of ordinary skill in the art would not be motivated to combine the Hawtof disclosure with the disclosure of Takahashi to achieve a process in which a first glass component consists of a vaporous or gaseous substance and a second glass component that is a liquid solution containing a rare earth metal, as Hawtof teaches that a glass component that consists of a vaporous or gaseous substance is undesirable.

Still further, there would be no reasonable expectation of success from combining the disclosures of Hawtof and Takahashi as suggested by the Examiner. Hawtof states that “... burner 40 incorporates within its structure atomizer 41, which injects very finely atomized liquid reactant particles into flame 23.” *Hawtof*, col. 8, lines 21-24. Hawtof explains that the liquid reactant particles contain a small portion of vapor because the liquid feedstock has been vaporized due to heating or other reasons. Unlike the claimed invention, the vaporized portion and the liquid portion are introduced in the flame

through the same channel, and as a result it is not possible to adjust the liquid and vapor portions separately, therefore making it impossible to find a workable temperature for the process. Furthermore, in Hawtof, both the vapor portion and the liquid portion are atomized when they exit the channel, whereas in the inventive process, only the liquid component is atomized. Based on these discrepancies between Hawtof and the claimed invention one would not expect to have success in combining the Hawtof and Takahashi references to arrive at the claimed process.

For at least the above reasons, claims 37, 38 and 41 are allowable over the combination of Hawtof and Takahashi.

Rejection of Claims 39 and 40 Based on Hawtof, Takahashi and Ainslie

Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 39 and 40 under 35 U.S.C. §103(a) as being unpatentable over Hawtof and Takahashi, as applied to claims 37 and 38, and further in view of Ainslie (US 4923,279).

Claims 39 and 40 depend from claim 37. Hawtof and Takahashi fail to render the method of claim 37 obvious for the reasons provided above. Ainslie does not supply the elements and motivation missing in the Hawtof and Takahashi disclosures. Furthermore, although Ainslie teaches the advantages of rare earth metals, Ainslie does not mention anything that would lead a skilled artisan to believe that the particular rare earth metals could be applied in a method as set forth in the present claims, i.e. introducing the rare earth metals to a flame in liquid form with another component and thereafter spraying the resultant particles. The Ainslie disclosure is limited to MVCD and a solution doping technique which is based on immersing a glass tube having porous glass layer on its inner surface in a rare earth solution. The relevant inquiry is not only whether a skilled artisan would gathered from Ainslie that the particular rare earth metals would be beneficial in the resultant fibers of the claimed method, as the Examiner has asserted, but also whether a skilled artisan having read Ainslie would have gathered that one could successfully

apply those rare earth metals in the claimed process. Ainslie provides no suggestion to apply the particular rare earth metals in the claimed method.

The Examiner has selectively applied only that portion of Ainslie which benefits his position in reconstructing the applicant's invention, while ignoring the entire teaching of Ainslie. Such an incomplete application of the reference is improper, and exhibits that the Examiner is improperly employing hindsight to reject the applicant's claims.

Still further, applicant has submitted evidence (in the 37 C.F.R. §1.132 Declaration filed in the Amendment in response to the Office Action dated April 21, 2005) concerning the MCVD method in comparison to the claimed method. Therefore, the Examiner is well aware of the beneficial and unexpected results achieved by the claimed invention over the MCVD method of Ainslie. In the Interview Summary dated April 21, 2005, the Examiner stated that the MCVD method did not appear relevant. However, Applicant is somewhat perplexed as to how the Examiner can consider the results of an MCVD method to be irrelevant to the unexpected results of the invention, while considering the teachings of the MCVD method to be relevant with respect to patentability.

For at the above reasons, claims 39 and 40 are allowable over the combination of Hawtof, Takahashi and Ainslie.

Rejection of claims 37-45 based on Randall, Hawtof, Ainslie and Takahashi

Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 37-45 under 35 U.S.C. §103(a) as being unpatentable over Randall (US 3883336) in view of Hawtof, Ainslie and Takahashi.

In contrast to the claimed invention as set forth in claims 37-45, Randall does not:

a) disclose introducing a second glass component to the vicinity of the flame downstream of the nozzle through the nozzle;

b) mention rare earth metals and a solution containing a rare earth ion, water or alcohol, and a form of aluminum which is soluble in water or alcohol (claim 42);

c) disclose introducing an atomizing gas to the vicinity of the flame downstream of the nozzle through the nozzle;

d) disclose atomizing the second glass component in the vicinity of the flame downstream of the nozzle; or

e) disclose producing glass particles containing a rare earth metal.

Hawtof uses atomizing gas and produces glass particles comprising rare earths. However, Hawtof begins with different materials than Randall. More specifically, Hawtof uses siloxane, which behaves quite differently from silicone tetrachloride, which is used in Randall.

Additionally, the vaporous portion mentioned in Hawtof refers to the low boiling point of the siloxane raw material. That is, the undesirable small vaporous portion forms due to the low boiling point of siloxane. Hawtof clearly suggests that too large of a vaporous portion can be harmful in the process, and the vaporous portion is part of the single component supplied in Hawtof. Thus, the Examiner's interpretation of the small vaporous portion as a first glass component and the liquid portion as second glass component is incorrect.

Based on the distinctions provided above, the Hawtof process is not similar to the Randall and does not provide similar results. Once again, applicant submits that the references must be considered in their entirety. The Examiner cannot merely pick and chose specific elements from each reference without regard for the complete teachings of the references. Because siloxane behaves differently than silicone tetrachloride, one of

ordinary skill in the art would not seek to combine the Hawtof and Randall processes to arrive at the claimed process.

With respect to claim 44, Hawtof also fails to disclose delivering the first and second glass components (as interpreted by the Examiner) through separate tubes. Therefore, combining the disclosures of Hawtof and Randall does not result in a teaching of delivering first and second glass components through separate tubes, as presently claimed.

Ainslie teaches the advantages of using rare earth metals. However, Ainslie does not mention anything that would lead a skilled artisan to believe that rare earth metals could be applied in a method as set forth in the present claims. Ainslie is limited to MVCD and a solution doping technique which is based on immersing a glass tube having porous glass layer on its inner surface in a rare earth solution. Again, the Examiner has selectively applied only that portion of Ainslie which benefits hindsight reconstruction of the applicant's invention, while failing to consider the teaching of Ainslie as a whole. As stated above, this incomplete application of the reference is improper.

Takahashi discloses a dopant in the form of an aqueous solution of a metallic salt. This aqueous solution is nebulized in a separate nebulizer, not in the vicinity of the flame downstream of the nozzle, as required by the present claims. Furthermore, the aqueous solution is not delivered through the same nozzle, as required by the present claims. The Examiner has asserted that there is no requirement that the aqueous solution be delivered through the same nozzle. Applicant disagrees. Claims 37, 42 and 44 each recite introducing the second glass component comprising a liquid solution to the vicinity of the flame downstream of the nozzle *through the nozzle*. Still further, there is no motivation in the references to combine the disclosure of Takahashi with the disclosures of Randall, Hawtof and Ainslie to arrive at the claimed process, as each of the prior art processes are quite different from each other.

Based on the above, it is clear that the references as combined by the Examiner do not result in the claimed invention, nor is there motivation in the references to combine their teachings as the Examiner has done.

Rejection of claims 46-52 based on of Randall, Hawtof, Ainslie, Takahashi and Finnish Patent 98832

Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 46-52 under 35 U.S.C. §103(a) as being unpatentable over Randall in view of Hawtof, Ainslie, Takahashi and Finnish patent 98832 (FI '832).

The Examiner stated that claims 46-52 are substantially the same as claims 37-45, except that claims 46-52 require that a fuel gas be used to cause atomizing. The Examiner asserted that FI '832 discloses the use of fuel gas as an atomizing gas. Despite the teachings of FI '832 with respect to using fuel gas as an atomizing gas, the same deficiencies cited with regard to the Examiner's combination of Randall, Hawtof, Ainslie and Takahashi in the rejection of claims 37-45 are present in the application of these references to claims 46-52. The disclosure FI '832 does not disclose anything to address the deficiencies in Randall, Hawtof, Ainslie and Takahashi as applied to the claimed invention. Therefore, claims 46-52 are allowable.

Conclusion

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 22-0185, under Order No. 20386-00294-US from which the undersigned is authorized to draw.

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Respectfully submitted,

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